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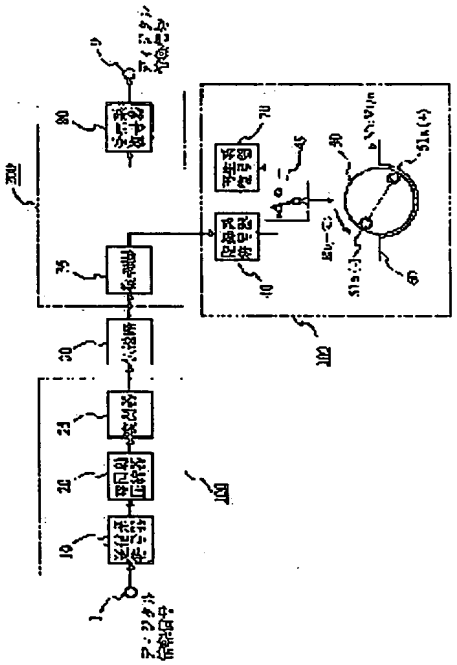
(54) DIGITAL INFORMATION RECORDING AND REPRODUCING DEVICE

(57)Abstract:
PURPOSE: To obtain a digital information recording and reproducing device capable of managing sales users and rental terms, etc., in a system performing sales and rentals of audio devices and video softs via radio waves and cables.
CONSTITUTION: Signal whose time base is compressed to 1/n and which is transmitted is demodulated by a demodulator 35 and demodulated signal is supplied to a recording system encoding unit 40 and recorded by being added with control information. At the time of reproduction, control information is detected in a reproducing system decoding unit 70 and then whether a reproduction is to be performed or not is judged in accordance with the information. Thus, rental terms, etc., are managed easily by recording sorts of information and dates of recordings, etc., to be recorded as control information and judging whether the reproduction is to be performed or not according to the information.



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CLAIMS

[Claim(s)]
[Claim 1] The digital-information record regenerative apparatus which carries out [consisting of a record means generates control information from the aforementioned additional information, and add and record the aforementioned control information on the aforementioned digital-information signal, and a regeneration means reproduce only when the aforementioned control information detects at the time of regeneration of the aforementioned digital-information signal and the detection result satisfies predetermined conditions, in the digital-information record regenerative apparatus which performs record regeneration of the digital-information signal with which additional information was added and transmitted, and] as the characteristic feature.
[Claim 2] The aforementioned control information is a digital information record regenerative apparatus according to claim 1 which includes the information which shows the modality of the aforementioned digital information signal, and is characterized by reproducing only when the aforementioned digital information signal is an information on a specific modality at the time of regeneration.
[Claim 3] The aforementioned control information is a digital information record regenerative apparatus according to claim 2 which includes the information which shows the time which carried out [aforementioned] digital information signal record, and is characterized by reproducing only when having not passed more than a predetermined term from the time which the aforementioned digital information signal is an information on a specific modality, and was recorded at the time of regeneration.

[Claim 4] The aforementioned control information is a digital information record regenerative apparatus according to claim 1 characterized by reproducing only when a regenerative apparatus or a regeneration person is in agreement with a recording device or a record person in the aforementioned digital information signal including the information which shows a recording device or a record person at the time of regeneration.
[Claim 5] It is the digital information record regenerative apparatus according to claim 1 characterized by for the aforementioned digital information signal being the unknown-episode-ized information, and the aforementioned control information canceling unknown episode-ization of the aforementioned digital information signal using the aforementioned control information including the information of which unknown episode-ization is canceled at the time of regeneration.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] this invention relates to the record regenerative apparatus of a digital information signal, especially, adds and records control information on a record signal, and relates to the digital information record regenerative apparatus reproduced using the additional information.
[0002]
[Description of the Prior Art] a television society magazine -- an audio, the software of a video, etc. like a publication are transmitted [page / 497th] through a Hertzian wave or a cable from the 494th page of 47th No. 4 (1993), and the system which records it at each home is considered
[0003]
[Problem(s) to be Solved by the Invention] When the above-mentioned conventional technique performed a soft sale and a soft rental of an audio or a video, there was a problem that a sale place, rental days, etc. had to be managed.
[0004] The purpose of this invention cancels such a trouble and is to offer the digital information record regenerative apparatus which can manage a sale place, rental days, etc. easily.
[0005]
[Means for Solving the Problem] In order to attain the above-mentioned purpose, in this invention, control information, such as a user number and record time, is added and recorded on a record signal, and they are ********s, such as a sale place and rental days, by the additional information at the time of regeneration.
[0006]
[Function] Control information, such as a user number and record time, is read at the time of regeneration, and when user numbers differ, it does not reproduce. Moreover, in a rental, when having passed more than a fixed term from record time, it does not reproduce. By doing in this way, a sale place, rental days, etc. are manageable.
[0007]
[Example] Hereafter, the example of this invention is explained using a drawing.
[0008] Drawing 1 is a block diagram showing one example of the digital information record regenerative apparatus by this invention. greatly It is divided into the transmitting system 100, the receiving system 200, and the record reversion system 300. 1 An input terminal, In 10, a transmitting system encoder and 20 a modulator and 30 for a time-base-compaction machine and 25 A transmission line, 35 -- a demodulator and 40 -- a recording system encoder and 45 -- for the magnetic head and 60, as for a reversion-system decoder and 80, a magnetic tape and 70 are [changeover ******** and 50 / a rotating drum, and 51a and 51b / a receiving system decoder and 9] output terminals In addition, in the magnetic heads 51a and 51b, (+) shows a right azimuth and (-) shows a negative azimuth.
[0009] In this drawing, it encodes by predetermined format with the transmitting system encoder 10, and time base compaction of the digital information signal into which the operation of the transmitting system 100 was inputted from the input terminal 1 is carried out to 1/n (in this invention, n is set as two or more integers) with the time-base-compaction vessel 20, a transmission rate is accelerated n times, a modulator 25 becomes irregular, and it is delivered to a transmission line 30.
[0010] In the receiving system 200, it restores to the signal received through the transmission line 30 by

the demodulator 35, and the recording system encoder 40 of the record reversion system 300 is directly supplied in the status [having carried out transmitting system coding of this signal to which it restored]. With the recording system encoder 40, record coding of this supplied signal is carried out by the format suitable for record regeneration.

[0011] Drawing 2 is a block diagram having shown the example of 1 configuration of this recording system encoder 40, and, for a store circuit and 42, as for a parity generation circuit and 44, an interface circuitry and 43 are [41 / a record signal generation circuit and 301] control information generation circuits. In this drawing, the data to which it restored by the demodulator 35 of the receiving system 200 are first memorized by the store circuit 41 through an interface circuitry 42. Drawing 3 (A) is this recovery data. In the parity generation circuit 42, from the recovery data memorized by the store circuit 41, parity is generated and a store circuit 41 memorizes. In the record signal generation circuit 43, the recovery data and parity which were memorized by the store circuit 41 are read, ID signal and the synchronizing signal which consist of the control information generated in the control information generation circuit 301 are added, and it outputs as a signal of a block format which is shown in drawing 3 (B). Drawing 4 is the example of 1 configuration of ID signal, for example, consists of the parity for an error detection correction of the track number for discriminating a recording track, the block number for discriminating a position in a truck, and control information and ID signal.

[0012] Thus, the signal by which recording system coding was carried out is supplied to the magnetic heads 51a and 51b attached in the position where a rotating drum 50 counters 180 degrees through changeover ******** 45, and azimuth record is carried out at a magnetic tape 60. The truck pattern at this time is shown in drawing 5 . In addition, the rotational speed of a rotating drum 50 and the travel speed of a magnetic tape 60 are set as R1 and V1 like the former, P is a track pitch, and W is the head width of face of the magnetic heads 51a and 51b. In this example, this head width-of-face W is larger than track pitch P, for example, is set up 1.5 times.

[0013] At the time of regeneration, a rotating drum 50 is rotated at the same speed R1 as the time of record, it is made for a magnetic tape 60 to run at the rate of [V1/n] 1/n at the time of record, and it reproduces the recorded signal by the magnetic heads 51a and 51b. Drawing 6 is drawing showing the truck pattern at the time of this regeneration, a solid line shows the recorded truck pattern and a dashed line shows the scanning tracing of the magnetic heads 51a and 51b. Thus, since a rotating drum 50 is rotated at the same speed R1 as the time of record and it is made to run a magnetic tape 60 at the rate of [V1/n] 1/n at the time of record, although the pitch of a scanning of the magnetic heads 51a and 51b turns into the P track pitches1/n and a scanning angle shifts a little, it will scan n times per about 1 truck. In addition, in this example, in order to simplify an explanation, n is set to 3. W shows the head width of face of the magnetic heads 51a and 51b, and usually, this head width of face (W) is larger than a track pitch (P), for example, is set up 1.5 times.

[0014] Drawing 7 is the configuration of a control signal. The information a program number indicates it to be the program of what position it is within a tape, and a hour entry are informations which show the elapsed time within a tape and a program. A modality is an information which shows the modality of that to which the digital information signal to record was sold, rented thing. In addition, the sold information may subdivide this information further according to the days [be / what was sold only to the specific user / it] to rent. Time when record time records, and a user number are a user's recorded registration numbers, and are memorized by the receiving system 200 or the record reversion system 300.

[0015] Control information can reduce redundancy by recording on two or more blocks dispersedly. Moreover, as shown in drawing 8 , you may record on the field different from a digital information signal. In this case, what is necessary is to make it the same block configuration as a digital information signal record section, and just to record control information on the fraction which records the recovery data of drawing 3 (B). In addition, control information can raise a reliability by carrying out multiplex writing.

[0016] If a user performs the application to a transmitting agency in receiving sale of a digital information signal, or a service of a rental, a digital information signal will be transmitted from a transmitting agency with the additional information which shows the modality of a user number and sale, or rental. In a receiving side, the user number in additional information is discriminated in the receiving system 200 or the record reversion system 300, and when in agreement, the information is recorded. At this time, the modality of sale or rental is discriminated from additional information, and it records as an information which shows the modality in control information.

[0017] Drawing 9 is a block diagram having shown the example of 1 configuration of the reversion-system decoder 70 which processes the whole reversion system. For a store circuit and 72, as for an error correction circuit and 74, a block regenerative circuit and 73 are [71 / a regenerative-signal output circuit and 302] control signal detectors. In this drawing, the signal reproduced by the magnetic heads 51a and 51b is first inputted into the block regenerative circuit 72. In this block regenerative circuit 72, a detection of a synchronizing signal and ID signal is performed, and it memorizes from the track number and block number in ID signal to the position on a store circuit 71. In the error correction circuit 73, the error in regeneration data is corrected using the parity memorized by the store circuit 71, the pointer in which the status of an error is shown is generated simultaneously, and it memorizes to a store circuit 71. Although the data of the same track number and a block number will be inputted into a store circuit 71 n times at this time, finally the data with the most sufficient status of an error are memorized by the pointer. In the regenerative-signal output circuit 74, the data after error correction processing memorized by the store circuit 71 are read according to the sequence of a track number and a block number, and the low-speed data which carried out time-axis extension are outputted.
[0018] Thus, the data signal of the low speed by which reversion-system decode processing was carried out is sent to the receiving system 200, and coding by the transmitting system is solved by the receiving system decoder 80. And the signal by which decode was carried out to the digital information signal of the origin of this is outputted from an output terminal 9.
[0019] Thus, this receiving system decoder 80 is good at low-speed processing by arranging it behind rather than arranging the receiving system decoder 80 before the record regeneration section 300.
[0020] In the control signal detector 302, it judges whether it reproduces by discriminating control information. For example, when a user number is in agreement with the selling gestalt, in the case of the sold information, it can reproduce only with the recorded equipment, and prevents from reproducing with other equipments to it. Record time is compared with a rental term, and when having passed over the rental term, it prevents from reproducing in the case of the rented information. In addition, you may perform this control by the receiving system 200. In this case, the control signal reproduced by the record reversion system 30 is outputted to the receiving system 200.
[0021] Drawing 10 is a block diagram showing other examples of the digital information record regenerative apparatus by this invention, and is the example which applied this invention to the system unknown-episode-ized video software, and transmitted it and only the subscriber enabled whose record regeneration. In this drawing, 15 omits the explanation which a scrambler, and 52a and 52b attach the magnetic head, a D/A converter, and 221, 222 and 223 are [an amount-of-information compressor, and 201 and 202 / an input terminal, and 111 and 112 / a descrambler, and 101, 102 and 103 / for an A/D converter, and 121 and 122] output terminals as for an amount-of-information expandor, and 211 and 212, and 75 attaches the same sign to the fraction corresponding to drawing 1 , and overlaps. In addition, in the magnetic heads 52a and 52b, (+) shows a right azimuth and (-) shows a negative azimuth.

[0022] In the transmitting system 100, A/D conversion of the picture signal inputted from the input terminal 101 is carried out by A/D converter 111, and amount-of-information compression is carried out by the amount-of-information compressor 121 to a suitable rate. A/D conversion of the sound signal inputted from the input terminal 102 is carried out by A/D converter 112, and amount-of-information compression is carried out by the amount-of-information compressor 122 to a suitable rate. the independent data into which A/D conversion was carried out and these picture signals by which amount-of-information compression was carried out, and the sound signal were inputted from the input terminal 103 -- the transmitting system encoder 10 -- time multiplexing -- and it encodes and is unknown-episode-ized by the scrambler 15 Hereafter, like the example of drawing 1 , time base compaction is carried out to 1/n with the time-base-compaction vessel 20, a modulator 25 becomes irregular, and this unknown-episode-ized signal is delivered to a transmission line 30.
[0023] By the receiving system 200, it restores to the signal received through the transmission line 30 by the demodulator 35 like the example of drawing 1 , and recovery data are supplied to the recording system encoder 40 of the record reversion system 300.
[0024] In the record reversion system 300, record coding of the recovery data supplied and carried out is carried out with the recording system encoder 40, through changeover ******** 45, 2 sets of magnetic heads 51a, 51b, 52a, and 52b are supplied, and two channel azimuth record is carried out at a

magnetic tape 60. A record frequency can be lowered to one half by two channel record using 2 sets of these magnetic heads 51a, 51b, 52a, and 52b. In addition, the rotational speed of a rotating drum 50 and the travel speed of a magnetic tape 60 are set as R2 and V2.
[0025] At the time of regeneration, a rotating drum 50 is rotated at the same speed R2 as the time of record, it is made for a magnetic tape 60 to run at the rate of [V2/n] 1/n at the time of record, and it reproduces the recorded signal by 1 set of magnetic heads 51a and 51b. In this example, since coefficient n of time base compaction is set up sufficiently greatly (it is originally so desirable that this n is large) and the one channel regeneration by 1 set of magnetic heads 51a and 51b can also be traced twice [n/] per one truck, sufficient data regeneration is possible by performing the same processing as the example of drawing 1 by the reversion-system decoder 70. Thereby, it is effective in the ability of the circuit of a reversion system to aim at a reduction of settled and a circuit scale by one line.
[0026] By the receiving system 200, the signal which decoded by the reversion-system decoder 70 is received, the signal unknown-episode-ized by the descrambler 75 by the transmitting system is dispelled, the double sign of the signal encoded by the receiving system decoder 80 by the transmitting system is carried out, and a picture signal, a sound signal, and independent data are separated. respectively, the amount-of-information expandors 201 and 202 develop to the original amount of information, and D/A conversion of this picture signal and sound signal that were separated is carried out by D/A converters 211 and 212, and they are outputted from output terminals 221 and 222. Moreover, the separated independent data are outputted from an output terminal 223.
[0027] Drawing 11 is the configuration of the control signal of the example of a view 10. A scramble information is an information required in order to perform a desk rumble. Usually, this information is memorized by the receiving system 200. This scramble information is memorized as control information, and the information recorded even if scramble was changed can be reproduced by outputting the scramble information reproduced at the time of regeneration to the receiving system 200, and performing a desk rumble.
[0028] Moreover, if scramble is changed periodically in the case of the rented information and it is made not to record a scramble information in control information, the information which passed during a fixed period cannot do a desk rumble, but can manage a rental term also by this.
[0029]
[Effect of the Invention] According to this invention, in a system which was described above and which performs sale and a rental for an audio, the software of a video, etc. through a Hertzian wave or a cable, a sale place, a rental term, etc. are [like] easily manageable.
[0030]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the block diagram showing one example of the digital information record regenerative apparatus by this invention.
[Drawing 2] It is the block diagram showing the example of 1 configuration of the recording system encoder concerning this invention.
[Drawing 3] It is drawing showing the I/O signal of the recording system encoder shown in drawing 2 .
[Drawing 4] It is drawing showing the example of 1 configuration of ID signal.
[Drawing 5] It is drawing showing the truck pattern at the time of record of the example of drawing 1 .
[Drawing 6] It is drawing showing the truck pattern at the time of regeneration of the example of drawing 1 .
[Drawing 7] It is drawing showing the example of 1 configuration of a control signal.
[Drawing 8] It is drawing showing other examples of the recording method of a control signal.
[Drawing 9] It is the block diagram showing the example of 1 configuration of the reversion-system encoder concerning this invention.
[Drawing 10] It is the block diagram showing other examples of the digital information record regenerative apparatus by this invention.
[Drawing 11] It is drawing showing the example of 1 configuration of the control signal of the example of drawing 10 .
[Description of Notations]
10 [-- A time-base-compaction machine, 25 / -- Modulator,] -- A transmitting system encoder, 15 -- A scrambler, 20 35 [-- A store circuit, 42 / -- Interface circuitry,] -- A demodulator, 40 -- A recording system encoder, 41 43 [-- Rotating drum,] -- A parity generation circuit, 44 -- A record signal generation circuit, 50 51a, 51b, 52a, 52b -- The magnetic head, 60 -- Magnetic tape, 70 [-- A block regenerative circuit, 73 / -- Error correction circuit,] -- A reversion-system decoder, 71 -- A store circuit, 72 74 [-- A receiving system decoder, 111, 112 / -- An A/D converter, 121, 122 / -- An amount-of-information compressor, 201, 202 / -- An amount-of-information expandor, 211, 212 / -- A D/A converter, 301 / -- A control signal generation circuit, 302 / -- Control signal detector.] -- A regenerative-signal output circuit, 75 -- A descrambler, 80

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